



Peter M. Rooney
Secretary for
Environmental
Protection

Air Resources Board

John D. Dunlap, III, Chairman
P.O. Box 2815 · 2020 L Street · Sacramento, California 95812 · www.arb.ca.gov



Pete Wilson
Governor

October 1, 1998

TO: All Interested Parties:

SUBJECT: **PROPOSED REFUELING EMISSIONS INVENTORY**

The Air Resources Board (ARB) staff is in the process of updating the refueling emissions estimates of off-road mobile sources using a new model called OFFROAD. This document describes the details related to the various input factors and methodology used to estimate the refueling emissions inventory.

It is the practice of the ARB staff to present major emission inventory changes to the Board for its approval. As such, staff plans to take the refueling inventory to the Board in the spring of 1999.

As part of the public review process we have scheduled a workshop to solicit your comments and suggestions on the enclosed Proposed Refueling Emission Inventory. The workshop is scheduled as follows:

DATE: November 20, 1998
TIME: 10:00 a.m. to 3:00 p.m.
PLACE: Monitoring and Laboratory Division
Northgate Laboratory
600 North Market Boulevard (at Northgate Blvd.)
Sacramento, California 95834

If you believe the underlying assumptions used to develop the inventory can be improved, we will be happy to review any supporting data or information. Written comments can be submitted to Dean Bloudoff at the address listed on the letterhead. Comments can be submitted to Mr. Bloudoff by E-Mail at dbloudof@arb.ca.gov. We would appreciate receiving your comments no later than December 1, 1998.

We are developing a Refueling Emissions Inventory Mailing list. If you would like to continue receiving information on the Refueling Emissions Inventory, please complete the enclosed mailing list update form.

This facility is accessible to persons with disabilities. If accommodation is needed, please contact Elizabeth Mongar at (916) 263-1630 or TDD (916) 324-9531 or (800) 700-8326

for TDD calls outside the Sacramento area by November 12, 1998. Please call Elizabeth Mongar at (916) 263-1630 if you plan on attending so that we can assure adequate seating.

We appreciate your participation in our process. If you have questions or need clarifications, please call Dean Bloudoff at (916) 263-2070.

Sincerely,

William V. Loscutoff, Chief
Monitoring and Laboratory Division

Enclosures

cc: Bob Cross, MSCD

UPDATE TO PROPOSED REFUELING EMISSIONS INVENTORY MAILING LIST

NAME: _____

AFFILIATION: _____

ADDRESS: _____

PHONE: _____ FAX: _____

E - MAIL ADDRESS: _____

We are updating our mailing lists. If you are interested in remaining on our PROPOSED REFUELING EMISSIONS INVENTORY mailing list please take a moment to fill out and return this form (Please print clearly).
We will delete your name from our mailing list if we do not receive this mailing list form by October 30, 1998.

MAIL/FAX THIS FORM TO:

**Elizabeth Mongar
Engineering and Laboratory Branch
Air Resources Board
P.O. Box 2815
Sacramento, CA 95812**

Phone: (916) 263-1630

Fax: (916) 263-2067

California Environmental Protection Agency

 Air Resources Board

DRAFT

Proposed Refueling Emission Inventory

October 1, 1998

Introduction

The purpose of this report is to provide an overview of the various input factors and methodology used to develop the refueling emissions inventory for off-road mobile sources. The off-road refueling emissions inventory includes estimates from the following equipment categories:

1. Agricultural
2. Airport Ground Support
3. Construction
4. Lawn and Garden
5. Light Duty Commercial
6. Light Duty Industrial
7. Logging
8. Pleasure Craft
9. Recreational
10. Transport Refrigeration Units

Refueling within these equipment categories is done predominantly with portable fuel containers, and to a lesser degree, dispensing facilities (service station or pump refueling). Often, refueling events using portable containers result in fuel spillage from over filling of equipment fuel tanks. Spillage can and does occur with these portable containers during transport and storage; portable containers are also a significant source of diurnal and resting losses. Both container and pump refueling can be directly associated with Hydrocarbon (HC) emissions from both spillage and vapor displacement.

Population and Activity

Statewide equipment populations and activity parameters such as usage in hrs/year, average maximum horsepower ratings, and load factors used in calculating the refueling emissions estimates are the same as those currently in the OFFROAD model. Two categories, Pleasure Craft and Large SI Engines, will be presented for Board approval later this year. For information on methodology and sources regarding these two categories please refer to Mobile Source Control (MSC) Division documents entitled “MSC 98-14 Pleasure Craft” and “MSC 98-11 Large SI Engines.” Any changes in these categories prior to final Board approval will be reflected in the refueling emissions estimates.

Refueling Events

There are two types of refueling events: pump refueling and portable container refueling. Refueling and evaporative emissions factors have been derived based on each type of refueling event. Refueling events are dependent on equipment and horsepower (hp) categories, as well as engine type. A complete definition of refueling events by equipment category are shown in Table 1.

Table 1
Refueling Event Definitions

Equipment Category	Hp Category	Engine Type	Refueling Event Type
Agricultural Airport Ground Support Construction Lawn & Garden Light Duty Commercial Light Duty Industrial Logging	ALL	2 Stroke	100 % Container Refueled
	≤ 25	4 Stroke	100 % Container Refueled
	> 25	4 Stroke	100 % Pump Refueled
Pleasure Craft (Excludes Personal Water Craft)	≤ 15	2/4 Stroke	100 % Container Refueled
	> 15	2/4 Stroke	100 % Pump Refueled
Personal Water Craft (PWC)	ALL	ALL	60% Container 40% Pump Refueled
Recreational	ALL	2 Stroke	100 % Container Refueled
	< 25	4 Stroke	100% Container Refueled
	≥ 25	4 Stroke	60% Container 40 % Pump Refueled
Transport Refrig. Units	ALL	ALL	100% Pump Refueled

As shown in Table 1, two equipment categories, PWC and Recreational, are best defined by a combination of both pump and container refueling. While it is generally accepted that equipment in these two categories receive some container refuelings, staff believes the number to be less than

100%. Therefore, a weighted average was selected of 60% container refueling and 40% pump refueling. This weighted average is based on fuel consumption rates, average tank volumes, and equipment activity. For example, a PWC can use approximately 40 gallons of fuel during 6 hours of continuous use. Based on a fuel tank size of 15 gallons and the assumption that only the first refueling is performed at the pump, the additional 25 gallons used must be delivered from a portable fuel container(s). This is representative of approximately 40% of the fuel used being delivered by the pump and 60% by portable container.

Where possible staff have selected the most conservative approach (lowest estimate) in estimating the container specific portions of the refueling emissions inventory (i.e., container transport/storage spillage, container diurnal). This is necessary because all calculations in these areas reflect the assumption that container populations are equal to equipment populations. Staff is aware that one portable refueling container may be used to perform refueling events on several individual pieces of equipment, justifying the conservative approach.

Refueling emission estimates are based on the assumption that all refuelings are fill-ups. Furthermore, all refueling emission estimates are calculated for gasoline fueled two and four stroke engines only.

Refueling Emission Components

Pump Refueling

There are two components of refueling emissions associated with pump refueling: (1) refueling spillage and (2) vapor displacement. Refueling spillage emissions are HC emissions that result from fuel spilled during the refueling event. Vapor displacement emissions are those HC emissions that result from displacing fuel vapors in the fuel tank with liquid fuel.

Container Refueling

There are five components of refueling emissions associated with container refueling: (1) refueling spillage, (2) vapor displacement, (3) container transport/storage spillage, (4) container diurnal losses, and (5) container resting losses. The first two, refueling spillage and vapor displacement, are as previously defined. Container transport/storage spillage emissions are HC emissions that result due to fuel spilled from the portable container during transport and while in storage. Container diurnal losses are HC emissions generated by the evaporation of liquid fuel from the vented portable container. Container resting losses are HC emissions generated by the permeation of fuel vapor while the portable container holds liquid fuel and vapors (significant only for plastic containers).

Emission Factors

Refueling Spillage Emission Factors

The average amount of fuel spilled during each refueling event is estimated at 3.6 grams/refuel for pump refueling, and 17 grams/refuel for portable container refueling. These estimates are based on data contained in the Nonroad Engine and Vehicle Emission Study (NEVES) report by the

U.S. Environmental Protection Agency (U.S.EPA). With the assumption that all refuelings are fill-ups, the amount of fuel spilled per gallon of gasoline consumed may be calculated by dividing the spillage event estimate (grams/refuel) by the equipment fuel tank volume (gallons/refuel) to calculate a spillage emission factor (grams/gallon consumed). Individual spillage emissions factors for each category are calculated as follows:

$$\text{Spillage EF}_{\text{pump}} \left[\frac{\text{g}}{\text{gal}} \right] = \frac{3.6}{\text{Tank Vol}} \left[\frac{\text{g}}{\frac{\text{gal}}{\text{refuel}}} \right]$$

$$\text{Spillage EF}_{\text{container}} \left[\frac{\text{g}}{\text{gal}} \right] = \frac{17.0}{\text{TankVol.}} \left[\frac{\text{g}}{\frac{\text{gal}}{\text{refuel}}} \right]$$

For equipment categories that are considered both container and pump refueled (see Table 1) a weighted average is calculated as follows:

$$[60\%] * 17 \text{ g/refuel}_{(\text{container})} + [40\%] * 3.6 \text{ g/refuel}_{(\text{pump})} = 11.64 \text{ g/refuel}_{\text{container/pump}}$$

Where 11.64 grams/refuel is considered the average amount of fuel spilled for the combined event. Thus, the combined event spillage emission factor for each category is calculated as follows:

$$\text{Spillage EF}_{\text{container/pump}} \left[\frac{\text{g}}{\text{gal}} \right] = \frac{11.64}{\text{TankVol.}} \left[\frac{\text{g}}{\frac{\text{gal}}{\text{refuel}}} \right]$$

Vapor Displacement Emission Factors

The pump dispensed refueling vapor displacement emission factor is 0.227 grams/gallon for Phase II vapor recovery systems as shown in Acurex Report FR-96-114, Table 5-41. Container dispensed refueling vapor displacement emission factors are calculated according to the

following equation shown in U. S. EPA NEVES Report:

$$\text{Disp.} = -5.909 + 0.0884 \times \text{Td} + 0.485 \times \text{RVP}$$

Where:

Disp.=	Displacement (grams/gallon)
Td =	Temperature of dispensed fuel (°F)
RVP =	Reid Vapor Pressure of fuel

Based on this equation using an average temperature of dispensed fuel of 75° and an RVP of 7.83, the container dispensed refueling vapor displacement emission factor is 4.52 grams/gallon. For equipment categories that are considered both container and pump refueled a weighted average is calculated as follows:

$$\text{Container/Pump Disp.} = [(60\%) \times 4.52 \text{ g/gal}_{\text{container}}] + [(40\%) \times 0.227 \text{ g/gal}_{\text{pump}}]$$

Based on this equation the container/pump dispensed refueling vapor displacement emission factor is 2.809 grams/gallon.

Container Transport/Storage Spillage Emission Factors

The average amount of fuel spilled from portable refueling containers during transport and storage is estimated at 18 grams/gallon of gasoline consumed. This estimate is based on data included in a report entitled, "OPEI/CAAC Spillage and Evaporative Hydrocarbon Losses for Lawn and Garden Applications" prepared by the Outdoor Power Equipment Institute (OPEI). The OPEI report separates container transport/storage spillage emission factors into two categories, commercial and consumer. In the report the emission factors for transport/storage spillage from portable containers is 9 grams/gallon for consumer applications, and 101 grams/gallon for commercial applications. While this division of equipment usage is easily defined in the Lawn and Garden category, the OFFROAD model contains several categories that cannot be segregated in this manner. Therefore, staff chose to use a weighted average to calculate a container transport/storage emission factor that could be applied to all categories in OFFROAD.

Using population data in California for the Lawn and Garden category, the ratio of consumer equipment verses commercial equipment is approximately 9 to 1. In the absence of data for the other categories in OFFROAD with respect to container spillage, staff used the OPEI data as a

surrogate for all categories to derive a universal container transport/storage spillage emission factor as follows:

$$\text{Container EF} = [9 \times (\text{9g/gal}_{\text{consumer}}) + 1 \times (\text{101g/gal}_{\text{commercial}})] / 10$$

where container EF is the container transport/storage emission factor given in grams/gallon of fuel consumed for all categories in OFFROAD that are considered container refueled. Based on this equation the container transport/storage emission factor is 18 grams/gallon. For equipment categories that are considered both container and pump refueled, a percentage of the container EF is calculated based on the refueling event definition.

Container Diurnal Loss Emission Factor

The container average diurnal mass loss rate is 1 gram/gallon/day as described in the report entitled "OPEI/CAAC Spillage and Evaporative Hydrocarbon Losses for Lawn and Garden Applications". Since State specific refueling container population data or average volume of stored fuel data are not available, staff determined a relationship between the average diurnal mass loss rates and equipment activity.

Diurnal losses are greatest when the portable container is left vented to the atmosphere (secondary vent open, open spout attached). To select the most conservative approach in calculating diurnal losses, staff made the assumption that portable containers are stored with secondary vents closed and spouts sealed, or removed and the portable containers capped. This implies that diurnal losses occur only when the portable containers are in use during refueling events which coincide with equipment use. Therefore, diurnal losses are directly related to equipment activity rates.

From anecdotal evidence staff selected a refueling container size of 2.5 gallons containing 2 gallons of liquid fuel to represent an average portable refueling container. Using the average diurnal loss rate of 1 gram/gallon/day provides us with the following equation:

$$2 \text{ gallon}_{(\text{liquid vol.})} \times 1 \text{ gram/gallon/day}_{(\text{avg. Diurnal loss rate})} = 2 \text{ grams/day}$$

where 2 grams/day is the average diurnal loss rate for a portable fuel container per day of equipment activity. To calculate a container diurnal loss emission factor in grams/year, the equipment activity is converted from hrs/year to days/years and multiplied by the average diurnal loss rate. This provides an equipment specific diurnal loss. Again, for equipment categories that are considered both container and pump refueled, a percentage of the container diurnal loss emission factor is calculated based on the refueling event definition.

Container Resting Loss Emission Factor

Resting loss emissions are not included in this report due to the lack of available data at this time.

However, these emissions may be significant. To determine the potential magnitude of these emissions the U.S. EPA NEVES report cites the amount of fuel a plastic storage container is permitted to lose and still meet the standards devised by the American Society for Testing and Materials (ASTM). A nonmetallic fuel container can pass the standards set by ASTM if it loses less than 1% of its mass over 30 days at a temperature of 75° F. This indicates the fuel container could lose as much as 28 grams of fuel a month.

Equipment Fuel Tank Volume

Estimates of equipment fuel tank volumes were derived from a report prepared for the ARB by Energy and Environmental Analysis (EEA) entitled, "Documentation of Input Factors for the New Off-Road Mobile Source Emissions Inventory Model" dated 1997. Where data were incomplete, staff supplemented fuel tank volume data from the U.S. EPA NEVES report, as well as the "OPEI/CAAC Spillage and Evaporative Hydrocarbon Losses for Lawn and Garden Applications" report by OPEI. A complete list of fuel tank volumes by equipment and hp category is shown in Attachment 1.

Methodology

OFFROAD generates a refueling emission inventory for HC pollutants by equipment type accounting for a given scenario year. The basic equation for OFFROAD is:

$$P_{I,y} = \sum_I [Pop_I * Emsfac_I * Hrs_I] + [CD EF * Pop_I]$$

where:

P	=	pollutant (grams/yr)
Pop	=	equipment population (# of units)
Emsfac	=	combined refueling emissions factors (grams/hr)
Hrs	=	annual average use (hours/year)
CD EF	=	container diurnal emission factor (grams/year)
y	=	scenario year (1970 - 2020)
I	=	equipment type

The combined refueling emissions factors (Emsfac) are calculated for each category using the following equation:

$$Emsfac = [\{bsfc * load * hp\} / density] * [Refuel EF + Vapor EF + Cont. EF]$$

where:

bsfc	=	brake specific fuel consumption (lb/Bhp-hr)
load	=	average load factor
hp	=	average horsepower (hp)
density	=	density of fuel (lb/gallon)
Refuel EF	=	Refueling spillage emission factor (g/gal)

Vapor EF = Displace vapor refueling emission factor (g/gal)
Cont. EF = Container Transport/Storage spillage emission factor (g/gal)

A complete list of all emission factors by category are shown in Attachment 1. Table 2 shows the statewide proposed refueling emission estimates in tons/day for CY 1990.

Table 2
1990 PROPOSED REFUELING EMISSIONS INVENTORY
(Statewide - Tons per Day)

Equipment Category	Fuel	HC
Agricultural	G4	1.213
Airport Ground	G4	0.006
Construction	G2	0.034
	G4	1.022
Lawn and Garden	G2	4.450
	G4	6.797
Light Duty Commercial	G2	0.208
	G4	4.189
Light Duty Industrial	G2	0.002
	G4	0.108
Logging	G2	0.309
	G4	0.837
Pleasure Craft	G2	1.590
	G4	0.114
Recreational	G2	10.125
	G4	4.180
Transport	G4	0.229
Total		35.412

G2 Gasoline - 2 stroke
G4 Gasoline - 4 stroke

ATTACHMENT 1

				Refuel EF	Spillage	Tank Vol.	vapor	Cont spill	Cont	bsfc		avgHp	density	Cnvt	Emsfac	Activity	1990 Pop
ASC	Equipment Name	Fuel	Hp Cat	g/gal	g/refuel	gal/refuel	g/gal	g/gal	g/year	lb/bHp-hr	load	Hp	lb/gal	gal/hr	g/hr	hrs/year	# of units
2260001010	Off-Road Motorcycles	G2	15	7.143	17	2.38	4.520	18.00	5.67	1.30	0.76	10	6.17	1.60	47.50	68	15,039
2260001010	Off-Road Motorcycles	G2	25	6.800	17	2.50	4.520	18.00	5.67	1.30	0.76	21	6.17	3.36	98.60	68	12,940
2260001010	Off-Road Motorcycles	G2	50	6.800	17	2.50	4.520	18.00	5.67	1.30	0.76	38	6.17	6.08	178.41	68	105,343
2260001010	Off-Road Motorcycles	G2	120	4.857	17	3.50	4.520	18.00	5.67	1.30	0.76	56	6.17	8.97	245.50	68	50,391
2260001020	Snowmobiles	G2	25	11.270	17	1.51	4.520	18.00	7.50	1.30	0.81	20	6.17	3.41	115.34	90	720
2260001020	Snowmobiles	G2	50	9.717	17	1.75	4.520	18.00	7.50	1.30	0.81	38	6.17	6.49	209.07	90	3,395
2260001020	Snowmobiles	G2	120	5.152	17	3.30	4.520	18.00	7.50	1.30	0.81	65	6.17	11.09	306.97	90	6,174
2260001030	All Terrain Vehicles (ATVs)	G2	15	12.143	17	1.40	4.520	18.00	5.67	1.30	0.81	13	6.17	2.22	76.90	68	10,320
2260001030	All Terrain Vehicles (ATVs)	G2	25	4.328	17	3.93	4.520	18.00	5.67	1.30	0.81	20	6.17	3.41	91.64	68	6,719
2260001030	All Terrain Vehicles (ATVs)	G2	50	3.279	17	5.18	4.520	18.00	5.67	1.30	0.81	30	6.17	5.12	132.09	68	8,842
2260001050	Golf Carts	G2	15	2.833	17	6.00	4.520	18.00	90.00	1.30	0.46	9	6.17	0.87	22.12	1,080	2,975
2260001060	Specialty Vehicles Carts	G2	15	2.833	17	6.00	4.520	18.00	95.42	1.30	0.58	7	6.17	0.86	21.69	1,145	24,406
2260002006	Tampers/Rammers	G2	15	18.085	17	0.94	4.520	18.00	15.17	1.30	0.55	4	6.17	0.46	18.82	182	3,021
2260002009	Plate Compactors	G2	15	18.085	17	0.94	4.520	18.00	17.17	1.30	0.55	4	6.17	0.46	18.82	206	259
2260003040	Other General Industrial Equipment	G2	15	3.778	17	4.50	4.520	18.00	31.25	1.30	0.54	8	6.17	0.91	23.94	375	87
2260004010	Lawn Mowers	G2	15	54.839	17	0.31	4.520	18.00	4.61	1.30	0.36	4	6.17	0.30	23.47	55	159,157
2260004020	Chainsaws <=5 HP	G2	2	68.000	17	0.25	4.520	18.00	6.88	1.30	0.50	1.03	6.17	0.11	9.82	83	197,560
2260004020	Chainsaws <=5 HP	G2	15	29.310	17	0.58	4.520	18.00	6.88	1.30	0.50	2.49	6.17	0.26	13.60	83	312,391
2260004025	Trimmers/Edgers/Brush Cutters	G2	2	94.444	17	0.18	4.520	18.00	3.83	1.30	0.50	1	6.17	0.11	12.32	46	941,157
2260004030	Leaf Blowers/Vacuums	G2	2	24.286	17	0.70	4.520	18.00	7.12	1.30	0.50	1	6.17	0.11	4.93	86	345,564
2260004035	Snowblowers	G2	15	73.913	17	0.23	4.520	18.00	1.38	1.30	0.35	6	6.17	0.44	42.67	16	2,107
2260004035	Snowblowers	G2	25	1.241	17	13.70	4.520	18.00	1.38	1.30	0.35	16	6.17	1.18	28.04	16	3
2260004050	Shredders <=5 HP	G2	15	54.839	17	0.31	4.520	18.00	10.52	1.30	0.80	6	6.17	1.01	78.24	126	2,669
2260004070	Commercial Turf Equipment	G2	25	6.559	17	2.59	4.520	18.00	66.67	1.30	0.50	19	6.17	2.00	58.21	800	392
2260004070	Commercial Turf Equipment	G2	15	3.400	17	5.00	4.520	18.00	66.67	1.30	0.50	9	6.17	0.95	24.58	800	795
2260004075	Other Lawn & Garden Equipment	G2	2	68.000	17	0.25	4.520	18.00	5.08	1.30	0.58	1	6.17	0.12	11.06	61	2,876
2260004075	Other Lawn & Garden Equipment	G2	15	29.825	17	0.57	4.520	18.00	5.08	1.30	0.58	5	6.17	0.61	31.98	61	1,252
2260006005	Generator Sets	G2	15	3.778	17	4.50	4.520	18.00	9.58	1.30	0.68	9	6.17	1.29	33.91	115	36
2260006005	Generator Sets	G2	2	17.000	17	1.00	4.520	18.00	9.58	1.30	0.68	1	6.17	0.14	5.66	115	3,574
2260006010	Pumps	G2	25	11.379	17	1.49	4.520	18.00	18.42	1.30	0.69	17	6.17	2.47	83.78	221	46
2260006010	Pumps	G2	15	22.667	17	0.75	4.520	18.00	18.42	1.30	0.69	8	6.17	1.16	52.55	221	3,830
2260006010	Pumps	G2	2	22.667	17	0.75	4.520	18.00	18.42	1.30	0.69	1	6.17	0.15	6.57	221	14,203
2260007005	Chainsaws >5 HP	G2	15	17.000	17	1.00	4.520	18.00	17.17	1.30	0.92	8	6.17	1.55	61.28	206	8,097
2265001010	Off-Road Motorcycles	G4	15	8.947	17	1.90	4.520	18.00	5.67	1.30	0.76	10	6.17	1.60	50.39	68	19,672
2265001010	Off-Road Motorcycles	G4	25	4.656	11.64	2.50	2.809	10.80	3.40	1.30	0.76	21	6.17	3.36	61.42	68	31,739

ATTACHMENT 1

2265001010	Off-Road Motorcycles	G4	50	5.291	11.64	2.20	2.809	10.80	3.40	1.30	0.76	38	6.17	6.08	115.01	68	33,065
2265001030	All Terrain Vehicles (ATVs)	G4	15	9.444	17	1.80	4.520	18.00	5.67	0.90	0.72	13	6.17	1.37	43.64	68	14,777
2265001030	All Terrain Vehicles (ATVs)	G4	25	4.891	11.64	2.38	2.809	10.80	3.40	0.80	0.72	20	6.17	1.87	34.54	68	205,595
2265001030	All Terrain Vehicles (ATVs)	G4	50	3.527	11.64	3.30	2.809	10.80	3.40	0.70	0.72	30	6.17	2.45	41.99	68	9,280
2265001040	Minibikes	G4	5	7.143	17	2.38	4.520	18.00	11.25	1.09	0.62	4	6.17	0.44	13.00	135	4,576
2265001050	Golf Carts	G4	15	2.833	17	6.00	4.520	18.00	90.00	0.90	0.46	9	6.17	0.60	15.31	1,080	7,343
2265001050	Golf Carts	G4	25	1.343	11.64	8.67	2.809	10.80	54.00	0.80	0.46	17	6.17	1.01	15.16	1,080	39
2265001060	Specialty Vehicles Carts	G4	5	2.833	17	6.00	4.520	18.00	95.42	1.09	0.58	5	6.17	0.51	12.99	1,145	5,014
2265001060	Specialty Vehicles Carts	G4	15	2.833	17	6.00	4.520	18.00	95.42	0.90	0.58	7	6.17	0.59	15.01	1,145	2,360
2265001060	Specialty Vehicles Carts	G4	25	1.202	11.64	9.68	2.809	10.80	57.25	0.80	0.58	19	6.17	1.43	21.16	1,145	5,057
2265001060	Specialty Vehicles Carts	G4	50	0.737	11.64	15.79	2.809	10.80	57.25	0.70	0.58	31	6.17	2.04	29.26	1,145	47
2265002003	Asphalt Pavers	G4	15	17.000	17	1.00	4.520	18.00	33.00	0.90	0.66	9	6.17	0.87	34.24	396	66
2265002003	Asphalt Pavers	G4	25	1.517	17	11.21	4.520	18.00	33.00	0.80	0.66	22	6.17	1.88	45.25	396	113
2265002003	Asphalt Pavers	G4	50	0.221	3.6	16.29	0.227	0.00	0.00	0.70	0.66	32	6.17	2.40	1.07	396	130
2265002003	Asphalt Pavers	G4	120	0.116	3.6	31.03	0.227	0.00	0.00	0.55	0.66	61	6.17	3.59	1.23	396	72
2265002006	Tampers/Rammers	G4	15	18.085	17	0.94	4.520	18.00	15.17	0.90	0.55	9	6.17	0.72	29.32	182	140
2265002009	Plate Compactors	G4	5	18.085	17	0.94	4.520	18.00	15.00	1.09	0.55	4	6.17	0.39	15.78	180	5,142
2265002009	Plate Compactors	G4	15	18.085	17	0.94	4.520	18.00	17.17	0.90	0.55	8	6.17	0.64	26.06	206	5,454
2265002015	Rollers	G4	5	17.000	17	1.00	4.520	18.00	6.92	1.09	0.62	5	6.17	0.55	21.64	83	573
2265002015	Rollers	G4	15	3.778	17	4.50	4.520	18.00	25.83	0.90	0.62	9	6.17	0.81	21.40	310	927
2265002015	Rollers	G4	25	1.756	17	9.68	4.520	18.00	25.83	0.80	0.62	19	6.17	1.53	37.08	310	626
2265002015	Rollers	G4	50	0.191	3.6	18.85	0.227	0.00	0.00	0.70	0.62	37	6.17	2.60	1.09	621	107
2265002015	Rollers	G4	120	0.093	3.6	38.71	0.227	0.00	0.00	0.55	0.62	76	6.17	4.20	1.34	621	216
2265002021	Paving Equipment	G4	5	17.000	17	1.00	4.520	18.00	14.17	1.09	0.59	4	6.17	0.42	16.48	170	7,196
2265002021	Paving Equipment	G4	15	3.778	17	4.50	4.520	18.00	16.67	0.90	0.59	10	6.17	0.86	22.63	200	12,174
2265002021	Paving Equipment	G4	25	1.517	17	11.21	4.520	18.00	16.67	0.80	0.59	22	6.17	1.68	40.45	200	271
2265002021	Paving Equipment	G4	50	0.191	3.6	18.85	0.227	0.00	0.00	0.70	0.59	37	6.17	2.48	1.04	200	418
2265002021	Paving Equipment	G4	120	0.107	3.6	33.64	0.227	0.00	0.00	0.55	0.59	66	6.17	3.47	1.16	200	107
2265002024	Surfacing Equipment	G4	5	17.000	17	1.00	4.520	18.00	16.67	1.09	0.49	5	6.17	0.43	17.11	200	1,321
2265002024	Surfacing Equipment	G4	15	3.778	17	4.50	4.520	18.00	41.92	0.90	0.49	8	6.17	0.57	15.04	503	3,926
2265002024	Surfacing Equipment	G4	25	1.756	17	9.68	4.520	18.00	41.92	0.80	0.49	19	6.17	1.21	29.30	503	54
2265002027	Signal Boards	G4	5	17.000	17	1.00	4.520	18.00	10.83	1.09	0.76	5	6.17	0.67	26.53	130	16
2265002027	Signal Boards	G4	15	3.778	17	4.50	4.520	18.00	23.67	0.90	0.76	8	6.17	0.89	23.32	284	116
2265002030	Trenchers	G4	15	3.778	17	4.50	4.520	18.00	36.17	0.90	0.66	10	6.17	0.96	25.32	434	1,074
2265002030	Trenchers	G4	25	1.587	17	10.71	4.520	18.00	36.17	0.80	0.66	21	6.17	1.80	43.32	434	832
2265002030	Trenchers	G4	50	0.228	3.6	15.79	0.227	0.00	0.00	0.70	0.66	31	6.17	2.32	1.06	434	703
2265002030	Trenchers	G4	120	0.105	3.6	34.29	0.227	0.00	0.00	0.55	0.66	67	6.17	3.94	1.31	434	504

ATTACHMENT 1

2265002030	Trenchers	G4	175	0.057	3.6	63.16	0.227	0.00	0.00	0.55	0.66	124	6.17	7.30	2.07	434	13
2265002033	Bore/Drill Rigs	G4	15	3.778	17	4.50	4.520	18.00	10.33	0.90	0.79	10	6.17	1.15	30.30	124	31
2265002033	Bore/Drill Rigs	G4	25	1.852	17	9.18	4.520	18.00	10.33	0.80	0.79	18	6.17	1.84	44.94	124	153
2265002033	Bore/Drill Rigs	G4	50	0.196	3.6	18.37	0.227	0.00	0.00	0.70	0.79	36	6.17	3.23	1.36	248	6
2265002033	Bore/Drill Rigs	G4	120	0.109	3.6	33.03	0.227	0.00	0.00	0.55	0.79	65	6.17	4.58	1.54	248	105
2265002033	Bore/Drill Rigs	G4	175	0.056	3.6	64.29	0.227	0.00	0.00	0.55	0.79	125	6.17	8.80	2.49	248	89
2265002036	Excavators	G4	120	0.088	3.6	40.91	0.227	0.00	0.00	0.55	0.53	80	6.17	3.78	1.19	393	2
2265002039	Concrete/Industrial Saws	G4	5	17.000	17	1.00	4.520	18.00	10.83	1.09	0.78	4	6.17	0.55	21.78	130	563
2265002039	Concrete/Industrial Saws	G4	15	3.778	17	4.50	4.520	18.00	25.83	0.90	0.78	9	6.17	1.02	26.93	310	2,533
2265002039	Concrete/Industrial Saws	G4	25	1.961	17	8.67	4.520	18.00	25.83	0.80	0.78	17	6.17	1.72	42.09	310	792
2265002039	Concrete/Industrial Saws	G4	50	0.208	3.6	17.31	0.227	0.00	0.00	0.70	0.78	34	6.17	3.01	1.31	622	278
2265002039	Concrete/Industrial Saws	G4	120	0.107	3.6	33.64	0.227	0.00	0.00	0.55	0.78	66	6.17	4.59	1.53	622	157
2265002042	Cement and Mortar Mixers	G4	5	17.000	17	1.00	4.520	18.00	7.67	1.09	0.59	5	6.17	0.52	20.60	92	10,226
2265002042	Cement and Mortar Mixers	G4	15	3.778	17	4.50	4.520	18.00	7.67	0.90	0.59	8	6.17	0.69	18.11	92	17,327
2265002042	Cement and Mortar Mixers	G4	25	1.331	17	12.77	4.520	18.00	7.67	0.80	0.59	25	6.17	1.91	45.61	92	73
2265002045	Cranes	G4	50	0.191	3.6	18.85	0.227	0.00	0.00	0.70	0.47	37	6.17	1.97	0.82	411	58
2265002045	Cranes	G4	120	0.112	3.6	32.14	0.227	0.00	0.00	0.55	0.47	63	6.17	2.64	0.89	411	69
2265002045	Cranes	G4	175	0.235	3.6	15.32	0.227	0.00	0.00	0.55	0.47	30	6.17	1.26	0.58	411	128
2265002054	Crushing/Proc. Equipment	G4	15	3.778	17	4.50	4.520	18.00	24.08	0.90	0.85	9	6.17	1.12	29.35	289	28
2265002054	Crushing/Proc. Equipment	G4	25	2.083	17	8.16	4.520	18.00	24.08	0.80	0.85	16	6.17	1.76	43.38	289	18
2265002054	Crushing/Proc. Equipment	G4	120	0.082	3.6	43.90	0.227	0.00	0.00	0.55	0.85	86	6.17	6.52	2.01	289	19
2265002054	Crushing/Proc. Equipment	G4	175	0.057	3.6	63.16	0.227	0.00	0.00	0.55	0.85	124	6.17	9.40	2.67	289	33
2265002057	Rough Terrain Forklifts	G4	50	0.150	3.6	24.00	0.227	0.00	0.00	0.70	0.63	47	6.17	3.36	1.27	475	22
2265002057	Rough Terrain Forklifts	G4	120	0.109	3.6	33.03	0.227	0.00	0.00	0.55	0.63	65	6.17	3.65	1.23	475	158
2265002057	Rough Terrain Forklifts	G4	175	0.056	3.6	64.29	0.227	0.00	0.00	0.55	0.63	126	6.17	7.08	2.00	475	118
2265002060	Rubber Tired Loaders	G4	50	0.172	3.6	20.93	0.227	0.00	0.00	0.70	0.54	41	6.17	2.51	1.00	569	102
2265002060	Rubber Tired Loaders	G4	120	0.101	3.6	35.64	0.227	0.00	0.00	0.55	0.54	70	6.17	3.37	1.11	569	318
2265002060	Rubber Tired Loaders	G4	175	0.056	3.6	64.29	0.227	0.00	0.00	0.55	0.54	127	6.17	6.11	1.73	569	25
2265002066	Tractors/Loaders/Backhoes	G4	120	0.155	3.6	23.23	0.227	0.00	0.00	0.55	0.48	63	6.17	2.70	1.03	879	177
2265002072	Skid Steer Loaders	G4	15	3.778	17	4.50	4.520	18.00	26.58	0.90	0.58	14	6.17	1.18	31.15	319	55
2265002072	Skid Steer Loaders	G4	25	1.756	17	9.68	4.520	18.00	26.58	0.80	0.58	19	6.17	1.43	34.69	319	3,656
2265002072	Skid Steer Loaders	G4	50	0.191	3.6	18.85	0.227	0.00	0.00	0.70	0.58	37	6.17	2.43	1.02	319	11,590
2265002072	Skid Steer Loaders	G4	120	0.107	3.6	33.64	0.227	0.00	0.00	0.55	0.58	66	6.17	3.41	1.14	319	738
2265002078	Dumpers/Tenders	G4	5	17.000	17	1.00	4.520	18.00	12.42	1.09	0.41	4	6.17	0.29	11.45	149	522
2265002078	Dumpers/Tenders	G4	15	3.778	17	4.50	4.520	18.00	12.42	0.90	0.41	9	6.17	0.54	14.15	149	1,113
2265002078	Dumpers/Tenders	G4	25	1.756	17	9.68	4.520	18.00	12.42	0.80	0.41	19	6.17	1.01	24.52	149	206
2265002078	Dumpers/Tenders	G4	120	0.107	3.6	33.64	0.227	0.00	0.00	0.55	0.41	66	6.17	2.41	0.81	149	28

ATTACHMENT 1

2265002081	Other Construction Equipment	G4	175	0.047	3.6	76.60	0.227	0.00	0.00	0.55	0.48	150	6.17	6.42	1.76	375	119
2265003010	Aerial Lifts	G4	15	5.862	17	2.90	4.520	18.00	31.25	0.90	0.46	13	6.17	0.87	24.76	375	17
2265003010	Aerial Lifts	G4	25	1.756	17	9.68	4.520	18.00	31.25	0.80	0.46	19	6.17	1.13	27.51	375	715
2265003010	Aerial Lifts	G4	50	0.214	3.6	16.82	0.227	0.00	0.00	0.70	0.46	33	6.17	1.72	0.76	375	616
2265003010	Aerial Lifts	G4	120	0.090	3.6	40.00	0.227	0.00	0.00	0.55	0.46	78	6.17	3.20	1.01	750	364
2265003020	Forklifts	G4	25	1.449	17	11.73	4.520	18.00	75.00	0.80	0.30	23	6.17	0.89	21.44	900	17
2265003020	Forklifts	G4	50	0.164	3.6	21.95	0.227	0.00	0.00	0.70	0.30	43	6.17	1.46	0.57	1,818	1,190
2265003020	Forklifts	G4	120	0.105	3.6	34.29	0.227	0.00	0.00	0.55	0.30	67	6.17	1.79	0.59	1,818	5,181
2265003020	Forklifts	G4	175	0.053	3.6	67.92	0.227	0.00	0.00	0.55	0.30	133	6.17	3.56	1.00	1,818	146
2265003030	Sweepers/Scrubbers	G4	15	3.778	17	4.50	4.520	18.00	22.50	0.90	0.71	8	6.17	0.83	21.79	270	486
2265003030	Sweepers/Scrubbers	G4	25	1.852	17	9.18	4.520	18.00	22.50	0.80	0.71	18	6.17	1.66	40.39	270	475
2265003030	Sweepers/Scrubbers	G4	50	0.196	3.6	18.37	0.227	0.00	0.00	0.70	0.71	36	6.17	2.90	1.23	547	1,123
2265003030	Sweepers/Scrubbers	G4	120	0.110	3.6	32.73	0.227	0.00	0.00	0.55	0.71	64	6.17	4.05	1.37	547	869
2265003030	Sweepers/Scrubbers	G4	175	0.056	3.6	64.29	0.227	0.00	0.00	0.55	0.71	126	6.17	7.97	2.26	547	116
2265003040	Other General Industrial Equipment	G4	15	3.778	17	4.50	4.520	18.00	31.25	0.90	0.54	8	6.17	0.63	16.57	375	964
2265003040	Other General Industrial Equipment	G4	25	1.852	17	9.18	4.520	18.00	35.83	0.80	0.54	18	6.17	1.26	30.72	430	316
2265003040	Other General Industrial Equipment	G4	50	0.235	3.6	15.32	0.227	0.00	0.00	0.70	0.54	30	6.17	1.84	0.85	870	308
2265003040	Other General Industrial Equipment	G4	120	0.097	3.6	37.11	0.227	0.00	0.00	0.55	0.54	73	6.17	3.51	1.14	870	200
2265003040	Other General Industrial Equipment	G4	175	0.053	3.6	67.92	0.227	0.00	0.00	0.55	0.54	132	6.17	6.35	1.78	870	13
2265003050	Other Material Handling Equipment	G4	50	0.157	3.6	22.93	0.227	0.00	0.00	0.70	0.53	45	6.17	2.71	1.04	417	64
2265003050	Other Material Handling Equipment	G4	120	0.133	3.6	27.07	0.227	0.00	0.00	0.55	0.53	53	6.17	2.50	0.90	417	188
2265004010	Lawn Mowers	G4	5	54.839	17	0.31	4.520	18.00	2.99	1.09	0.36	4	6.17	0.25	19.68	36	1,989,369
2265004015	Tillers	G4	5	54.839	17	0.31	4.520	18.00	3.11	1.09	0.40	4	6.17	0.28	21.87	37	119,385
2265004025	Trimmers/Edgers/Brush Cutters	G4	5	94.444	17	0.18	4.520	18.00	5.00	1.09	0.36	1	6.17	0.06	7.44	60	52,979
2265004030	Leaf Blowers/Vacuums	G4	5	24.286	17	0.70	4.520	18.00	7.24	1.09	0.36	2	6.17	0.13	5.95	87	3,638
2265004035	Snowblowers	G4	5	54.839	17	0.31	4.520	18.00	1.38	1.09	0.35	4	6.17	0.25	19.13	16	22,795
2265004035	Snowblowers	G4	25	5.862	17	2.90	4.520	18.00	1.38	0.80	0.35	16	6.17	0.73	20.61	16	50
2265004035	Snowblowers	G4	15	24.286	17	0.70	4.520	18.00	1.38	0.90	0.35	9	6.17	0.46	21.51	16	17,247
2265004040	Rear Engine Riding Mowers	G4	25	5.862	17	2.90	4.520	18.00	3.88	0.80	0.38	17	6.17	0.84	23.77	46	109
2265004040	Rear Engine Riding Mowers	G4	15	6.939	17	2.45	4.520	18.00	3.88	0.90	0.38	9	6.17	0.50	14.70	46	24,268
2265004045	Front Mowers	G4	25	5.862	17	2.90	4.520	18.00	4.13	0.80	0.42	17	6.17	0.93	26.28	50	32,085
2265004045	Front Mowers	G4	15	6.939	17	2.45	4.520	18.00	4.13	0.90	0.42	13	6.17	0.80	23.46	50	40,967
2265004050	Shredders <=5 HP	G4	5	54.839	17	0.31	4.520	18.00	10.52	1.09	0.80	4	6.17	0.57	43.73	126	6,943
2265004055	Lawn & Garden Tractors	G4	25	5.862	17	2.90	4.520	18.00	4.98	0.80	0.60	17	6.17	1.32	37.54	60	11,088
2265004055	Lawn & Garden Tractors	G4	15	6.939	17	2.45	4.520	18.00	4.98	0.90	0.60	11	6.17	0.96	28.36	60	28,114
2265004060	Wood Splitters	G4	5	17.000	17	1.00	4.520	18.00	6.33	1.09	0.69	5	6.17	0.61	24.09	76	62,209
2265004065	Chippers/Stump Grinders	G4	25	1.587	17	10.71	4.520	18.00	38.75	0.80	0.78	18	6.17	1.82	43.88	465	1,511

ATTACHMENT 1

2265004065	Chippers/Stump Grinders	G4	15	3.778	17	4.50	4.520	18.00	38.75	0.90	0.78	11	6.17	1.25	32.91	465	267
2265004070	Commercial Turf Equipment	G4	25	1.852	17	9.18	4.520	18.00	66.67	0.80	0.50	19	6.17	1.23	30.02	800	3,525
2265004070	Commercial Turf Equipment	G4	15	3.400	17	5.00	4.520	18.00	66.67	0.90	0.50	11	6.17	0.80	20.79	800	7,157
2265004075	Other Lawn & Garden Equipment	G4	25	1.700	17	10.00	4.520	18.00	5.08	0.80	0.58	17	6.17	1.28	30.96	61	508
2265004075	Other Lawn & Garden Equipment	G4	5	54.839	17	0.31	4.520	18.00	5.08	1.09	0.58	4	6.17	0.41	31.71	61	53,807
2265004075	Other Lawn & Garden Equipment	G4	15	3.400	17	5.00	4.520	18.00	5.08	0.90	0.58	8	6.17	0.68	17.54	61	23,897
2265005010	2-Wheel Tractors	G4	5	54.839	17	0.31	4.520	18.00	13.33	1.09	0.62	4	6.17	0.44	33.89	160	953
2265005010	2-Wheel Tractors	G4	15	3.778	17	4.50	4.520	18.00	27.67	0.90	0.62	8	6.17	0.72	19.03	332	1,109
2265005010	2-Wheel Tractors	G4	25	5.862	17	2.90	4.520	18.00	27.67	0.80	0.62	16	6.17	1.29	36.51	332	30
2265005015	Agricultural Tractors	G4	120	0.162	3.6	22.19	0.227	0.00	0.00	0.55	0.62	82	6.17	4.53	1.76	616	924
2265005015	Agricultural Tractors	G4	175	0.129	3.6	27.99	0.227	0.00	0.00	0.55	0.62	125	6.17	6.91	2.46	616	114
2265005020	Combines	G4	120	0.031	3.6	116.13	0.227	0.00	0.00	0.55	0.74	102	6.17	6.73	1.74	153	181
2265005020	Combines	G4	175	0.030	3.6	120.00	0.227	0.00	0.00	0.55	0.74	151	6.17	9.96	2.56	153	92
2265005020	Combines	G4	250	0.030	3.6	120.00	0.227	0.00	0.00	0.55	0.74	194	6.17	12.80	3.29	153	53
2265005025	Balers	G4	50	0.129	3.6	27.99	0.227	0.00	0.00	0.70	0.55	35	6.17	2.18	0.78	99	4,356
2265005025	Balers	G4	120	0.129	3.6	27.99	0.227	0.00	0.00	0.55	0.55	64	6.17	3.14	1.12	99	878
2265005025	Balers	G4	175	0.064	3.6	55.99	0.227	0.00	0.00	0.55	0.55	124	6.17	6.08	1.77	99	300
2265005030	Agricultural Mowers	G4	15	6.939	17	2.45	4.520	18.00	15.00	0.90	0.48	8	6.17	0.56	16.50	180	990
2265005030	Agricultural Mowers	G4	25	5.862	17	2.90	4.520	18.00	15.00	0.80	0.48	18	6.17	1.12	31.80	180	810
2265005035	Sprayers	G4	5	54.839	17	0.31	4.520	18.00	8.17	1.09	0.50	4	6.17	0.35	27.33	98	3,756
2265005035	Sprayers	G4	15	3.778	17	4.50	4.520	18.00	8.17	0.90	0.50	7	6.17	0.51	13.43	98	1,169
2265005035	Sprayers	G4	25	1.901	17	8.94	4.520	18.00	8.17	0.80	0.50	17	6.17	1.10	26.91	98	3,024
2265005035	Sprayers	G4	50	0.208	3.6	17.31	0.227	0.00	0.00	0.70	0.50	34	6.17	1.93	0.84	98	500
2265005035	Sprayers	G4	120	0.106	3.6	34.00	0.227	0.00	0.00	0.55	0.50	66	6.17	2.94	0.98	98	2,158
2265005035	Sprayers	G4	175	0.052	3.6	69.23	0.227	0.00	0.00	0.55	0.50	135	6.17	6.02	1.68	98	332
2265005040	Tillers >5 HP	G4	15	29.825	17	0.57	4.520	18.00	5.92	0.90	0.71	7	6.17	0.72	37.95	71	127,845
2265005045	Swathers	G4	120	0.081	3.6	44.44	0.227	0.00	0.00	0.55	0.52	87	6.17	4.03	1.24	118	3,248
2265005045	Swathers	G4	175	0.055	3.6	65.45	0.227	0.00	0.00	0.55	0.52	129	6.17	5.98	1.69	118	2,535
2265005050	Hydro Power Units	G4	5	73.913	17	0.23	4.520	18.00	14.58	1.09	0.56	5	6.17	0.49	47.70	175	226
2265005050	Hydro Power Units	G4	15	3.778	17	4.50	4.520	18.00	38.67	0.90	0.56	8	6.17	0.65	17.19	464	452
2265005050	Hydro Power Units	G4	25	1.961	17	8.67	4.520	18.00	38.67	0.80	0.56	17	6.17	1.23	30.22	464	172
2265005050	Hydro Power Units	G4	50	0.208	3.6	17.31	0.227	0.00	0.00	0.70	0.56	34	6.17	2.16	0.94	464	248
2265005050	Hydro Power Units	G4	120	0.078	3.6	46.15	0.227	0.00	0.00	0.55	0.56	91	6.17	4.54	1.39	464	2,596
2265005050	Hydro Power Units	G4	175	0.052	3.6	69.23	0.227	0.00	0.00	0.55	0.56	136	6.17	6.79	1.89	464	1,008
2265005050	Hydro Power Units	G4	250	0.033	3.6	109.09	0.227	0.00	0.00	0.55	0.56	211	6.17	10.53	2.74	464	1,099
2265005055	Other Agricultural Equipment	G4	5	54.839	17	0.31	4.520	18.00	12.08	1.09	0.55	4	6.17	0.39	30.07	145	158
2265005055	Other Agricultural Equipment	G4	15	3.778	17	4.50	4.520	18.00	12.08	0.90	0.55	10	6.17	0.80	21.10	145	138
2265005055	Other Agricultural Equipment	G4	25	1.331	17	12.77	4.520	18.00	12.08	0.80	0.55	25	6.17	1.78	42.52	145	35
2265005055	Other Agricultural Equipment	G4	50	0.221	3.6	16.29	0.227	0.00	0.00	0.70	0.55	32	6.17	2.00	0.89	145	81
2265005055	Other Agricultural Equipment	G4	120	0.105	3.6	34.29	0.227	0.00	0.00	0.55	0.55	67	6.17	3.28	1.09	145	587

ATTACHMENT 1

2265005055	Other Agricultural Equipment	G4	175	0.072	3.6	50.00	0.227	0.00	0.00	0.55	0.55	135	6.17	6.62	1.98	145	88
2265005055	Other Agricultural Equipment	G4	250	0.033	3.6	110.09	0.227	0.00	0.00	0.55	0.55	246	6.17	12.06	3.13	145	23
2265006005	Generator Sets	G4	50	0.221	3.6	16.29	0.227	0.00	0.00	0.70	0.68	32	6.17	2.47	1.11	115	4,855
2265006005	Generator Sets	G4	120	0.129	3.6	28.00	0.227	0.00	0.00	0.55	0.68	83	6.17	5.03	1.79	115	5,206
2265006005	Generator Sets	G4	25	1.756	17	9.68	4.520	18.00	9.58	0.80	0.68	19	6.17	1.68	40.67	115	69,241
2265006005	Generator Sets	G4	15	3.778	17	4.50	4.520	18.00	9.58	0.90	0.68	9	6.17	0.89	23.48	115	128,874
2265006005	Generator Sets	G4	5	22.667	17	0.75	4.520	18.00	9.58	1.09	0.68	4	6.17	0.48	21.71	115	46,918
2265006005	Generator Sets	G4	175	0.086	3.6	42.00	0.227	0.00	0.00	0.55	0.68	146	6.17	8.85	2.77	115	1,635
2265006010	Pumps	G4	175	0.086	3.6	42.00	0.227	0.00	0.00	0.55	0.69	144	6.17	8.86	2.77	221	217
2265006010	Pumps	G4	15	3.778	17	4.50	4.520	18.00	18.42	0.90	0.69	8	6.17	0.81	21.17	221	18,034
2265006010	Pumps	G4	25	1.961	17	8.67	4.520	18.00	18.42	0.80	0.69	17	6.17	1.52	37.23	221	4,619
2265006010	Pumps	G4	5	22.667	17	0.75	4.520	18.00	18.42	1.09	0.69	3	6.17	0.37	16.52	221	16,642
2265006010	Pumps	G4	50	0.221	3.6	16.29	0.227	0.00	0.00	0.70	0.69	32	6.17	2.51	1.12	221	981
2265006010	Pumps	G4	120	0.129	3.6	28.00	0.227	0.00	0.00	0.55	0.69	93	6.17	5.72	2.03	221	1,867
2265006015	Air Compressors	G4	50	0.176	3.6	20.45	0.227	0.00	0.00	0.70	0.56	35	6.17	2.22	0.90	484	436
2265006015	Air Compressors	G4	120	0.129	3.6	28.00	0.227	0.00	0.00	0.55	0.56	70	6.17	3.49	1.24	484	1,817
2265006015	Air Compressors	G4	25	1.961	17	8.67	4.520	18.00	40.33	0.80	0.56	17	6.17	1.23	30.22	484	410
2265006015	Air Compressors	G4	15	3.778	17	4.50	4.520	18.00	40.33	0.90	0.56	7	6.17	0.57	15.04	484	3,043
2265006015	Air Compressors	G4	5	15.044	17	1.13	4.520	18.00	40.33	1.09	0.56	5	6.17	0.49	18.58	484	6,012
2265006015	Air Compressors	G4	175	0.086	3.6	42.01	0.227	0.00	0.00	0.55	0.56	135	6.17	6.74	2.11	484	430
2265006020	Gas Compressors	G4	120	0.086	3.6	42.01	0.227	0.00	0.00	0.55	0.85	88	6.17	6.67	2.09	8,500	85
2265006020	Gas Compressors	G4	175	0.062	3.6	57.97	0.227	0.00	0.00	0.55	0.85	146	6.17	11.06	3.20	8,500	52
2265006020	Gas Compressors	G4	50	0.129	3.6	28.00	0.227	0.00	0.00	0.70	0.85	32	6.17	3.09	1.10	8,500	32
2265006025	Welders	G4	175	0.062	3.6	57.97	0.227	0.00	0.00	0.55	0.51	130	6.17	5.91	1.71	208	722
2265006025	Welders	G4	120	0.086	3.6	42.01	0.227	0.00	0.00	0.55	0.51	70	6.17	3.18	1.00	208	2,989
2265006025	Welders	G4	50	0.153	3.6	23.53	0.227	0.00	0.00	0.70	0.51	45	6.17	2.60	0.99	208	2,255
2265006025	Welders	G4	25	1.700	17	10.00	4.520	18.00	17.33	0.80	0.51	17	6.17	1.12	27.23	208	23,800
2265006025	Welders	G4	15	11.333	17	1.50	4.520	18.00	17.33	0.90	0.51	11	6.17	0.82	27.70	208	6,584
2265006030	Pressure Washers	G4	5	73.913	17	0.23	4.520	18.00	9.58	1.09	0.85	5	6.17	0.75	72.40	115	12,603
2265006030	Pressure Washers	G4	15	3.778	17	4.50	4.520	18.00	9.58	0.90	0.85	7	6.17	0.87	22.82	115	11,243
2265006030	Pressure Washers	G4	25	1.852	17	9.18	4.520	18.00	9.58	0.80	0.85	18	6.17	1.98	48.35	115	2,111
2265006030	Pressure Washers	G4	50	0.191	3.6	18.85	0.227	0.00	0.00	0.70	0.85	29	6.17	2.80	1.17	115	48
2265007010	Shredders > 5 HP	G4	15	73.913	17	0.23	4.520	18.00	20.17	0.90	0.80	8	6.17	0.93	90.02	242	12,704
2265008015	A/C Tug, Narrow Body	G4	175	0.054	3.6	66.67	0.227	0.00	0.00	0.55	0.80	130	6.17	9.27	2.61	551	40
2265008020	A/C Tug, Wide Body	G4	500	0.048	3.6	75.00	0.227	0.00	0.00	0.55	0.80	500	6.17	35.66	9.81	515	14
2265008025	Air Conditioner	G4	175	0.054	3.6	66.67	0.227	0.00	0.00	0.55	0.75	130	6.17	8.69	2.44	22	1
2265008030	Air Start Unit	G4	175	0.054	3.6	66.67	0.227	0.00	0.00	0.55	0.90	130	6.17	10.43	2.93	135	1
2265008035	Baggage Tug	G4	120	0.071	3.6	50.70	0.227	0.00	0.00	0.55	0.55	100	6.17	4.90	1.46	876	559
2265008040	Belt Loader	G4	120	0.118	3.6	30.51	0.227	0.00	0.00	0.55	0.50	60	6.17	2.67	0.92	810	264
2265008045	Bobtail	G4	120	0.071	3.6	50.70	0.227	0.00	0.00	0.55	0.55	100	6.17	4.90	1.46	876	86

ATTACHMENT 1

2265008050	Cargo Loader	G4	120	0.101	3.6	35.64	0.227	0.00	0.00	0.55	0.50	70	6.17	3.12	1.02	719	75
2265008055	Cart	G4	15	1.700	17	10.00	4.520	18.00	12.50	0.90	0.50	12	6.17	0.88	21.20	150	23
2265008060	Deicer	G4	120	0.076	3.6	47.37	0.227	0.00	0.00	0.55	0.95	93	6.17	7.88	2.39	22	32
2265008065	Forklift	G4	50	0.141	3.6	25.53	0.227	0.00	0.00	0.70	0.30	50	6.17	1.70	0.63	726	71
2265008070	Fuel Truck	G4	175	0.054	3.6	66.67	0.227	0.00	0.00	0.55	0.25	130	6.17	2.90	0.81	22	45
2265008075	Ground Power Unit	G4	175	0.047	3.6	76.60	0.227	0.00	0.00	0.55	0.75	150	6.17	10.03	2.75	796	57
2265008080	Lav Cart	G4	15	3.400	17	5.00	4.520	18.00	12.50	0.90	0.50	12	6.17	0.88	22.69	150	3
2265008085	Lav Truck	G4	175	0.086	3.6	42.01	0.227	0.00	0.00	0.55	0.25	130	6.17	2.90	0.91	1,212	63
2265008090	Lift	G4	120	0.071	3.6	50.70	0.227	0.00	0.00	0.55	0.50	100	6.17	4.46	1.33	376	119
2265008095	Maint. Truck	G4	175	0.054	3.6	66.67	0.227	0.00	0.00	0.55	0.50	130	6.17	5.79	1.63	449	83
2265008100	Other	G4	50	0.141	3.6	25.53	0.227	0.00	0.00	0.70	0.50	50	6.17	2.84	1.04	183	130
2265008105	Service Truck	G4	250	0.039	3.6	92.31	0.227	0.00	0.00	0.55	0.20	180	6.17	3.21	0.85	1,299	136
2265008110	Water Truck	G4	175	0.047	3.6	76.60	0.227	0.00	0.00	0.55	0.20	150	6.17	2.67	0.73	310	20
2265009005	Transport Refrigeration Units	G4	15	0.800	3.6	4.50	0.227	0.00	0.00	0.90	0.50	12	6.17	0.88	23.02	750	4,367
2282005010	Vessels w/Outboard Engines	82	2	12.140	17	1.40	4.520	18.00	11.17	1.30	0.00	0	6.17	0.00	0.00	134	3,004
2282005010	Vessels w/Outboard Engines	82	15	2.833	17	6.00	4.520	18.00	0.50	1.30	0.75	7	6.17	1.11	28.04	6	166,310
2282005010	Vessels w/Outboard Engines	82	25	0.353	3.6	10.20	0.227	0.00	0.00	1.30	0.75	20	6.17	3.16	1.83	17	45,193
2282005010	Vessels w/Outboard Engines	82	50	0.164	3.6	21.95	0.227	0.00	0.00	1.30	0.75	43	6.17	6.79	2.66	32	44,121
2282005010	Vessels w/Outboard Engines	82	120	0.078	3.6	46.15	0.227	0.00	0.00	1.30	0.75	90	6.17	14.22	4.34	148	38,797
2282005010	Vessels w/Outboard Engines	82	175	0.046	3.6	78.26	0.227	0.00	0.00	1.30	0.75	154	6.17	24.34	6.64	204	17,916
2282005010	Vessels w/Outboard Engines	82	250	0.032	3.6	112.50	0.227	0.00	0.00	1.30	0.75	221	6.17	34.92	9.05	266	5,144
2282005010	Vessels w/Outboard Engines	82	500	0.024	3.6	150.00	0.227	0.00	0.00	1.30	0.75	291	6.17	45.98	11.54	804	1,038
2282005025	Sailboat Auxiliary Outboard Engine	82	15	2.833	17	6.00	4.520	18.00	2.25	1.30	0.75	7	6.17	1.11	28.04	27	3,744
2282005025	Sailboat Auxiliary Outboard Engine	82	25	0.353	3.6	10.20	0.227	0.00	0.00	1.30	0.75	20	6.17	3.16	1.83	13	2,013
2282005025	Sailboat Auxiliary Outboard Engine	82	50	0.164	3.6	21.95	0.227	0.00	0.00	1.30	0.75	43	6.17	6.79	2.66	14	1,867
2282005030	Personal Water Craft	82	120	0.728	11.64	16.00	2.809	10.80	3.25	0.90	0.76	45	6.17	4.99	71.52	65	90,072
2282010005	Vessels w/Inboard Engines	82	250	0.036	3.6	100.00	0.227	0.00	0.00	0.55	0.75	206	6.17	13.77	3.62	227	45,557
2282010010	Vessels w/Outboard Engines	82	250	0.060	3.6	60.00	0.227	0.00	0.00	0.55	0.00	0	6.17	0.00	0.00	57	16,494
2282010020	Sailboat Auxiliary Inboard Engine	82	50	0.235	3.6	15.32	0.227	0.00	0.00	0.70	0.75	30	6.17	2.55	1.18	55	6,086
2282010035	Vessels w/Inboard/Outboard Engine	82	250	0.164	3.6	22.00	0.227	0.00	0.00	0.00	0.00	0	6.17	0.00	0.00	160	176,272
2282010040	Vessels w/Inboard Jet Engines	82	500	0.082	3.6	44.01	0.227	0.00	0.00	0.00	0.00	0	6.17	0.00	0.00	132	46,543